UK sees fifth wettest October since 1862

Description

One thing for certain is that October 2020 will be remembered for being exceptionally wet for some areas of the UK. The unsettled weather following Storm Alex brought enough rain on 3rd October to make it the wettest day on record for UK-averaged rainfall (31.7 mm, beating the previous wettest day of 29.9 mm on 25th August 1986). Persistent rain between the 2nd and 4th across the whole UK led to many stations breaking records for daily rainfall totals, and many parts of England and eastern Scotland have largely exceeded their average rainfall for October, making October 2020 now rank as the 5th wettest October on record for the UK.

The month finished as it began as two separate Atlantic low-pressure systems brought further heavy and persistent rain as well as strong south-westerly winds. Yellow warnings covered parts of north-west England, Wales and western parts of Scotland. The remnants of former hurricane Zeta brought strong winds to the UK, and a weather station in Sutherland recorded the strongest gusts in the month of 79mph on the 31st.

Towards the end of the month a warm conveyor – a band of warm, moist air that gets carried aloft in a frontal weather system and leads to the formation of heavy and persistent rain – brought continual rain on a south-westerly flow to parts of the UK, especially high ground in the west, including Brecon Beacons, Snowdonia National Park and the Lake District. The forecasting of this feature led the Met Office to issue yellow warnings for heavy rain.

Rainfall

Tim Legg, a scientist from the Met Office National Climate Information Centre, commented: “Rainfall totals were near average in many western areas of the UK but well above average in some eastern areas including eastern Scotland, north-east England, the south Midlands, London and central southern England. Overall, the south-east of England has experienced the highest volume of rainfall with 188% (174.3 mm) of its monthly average and parts of London, south-east England and Aberdeenshire had double the average rainfall.”

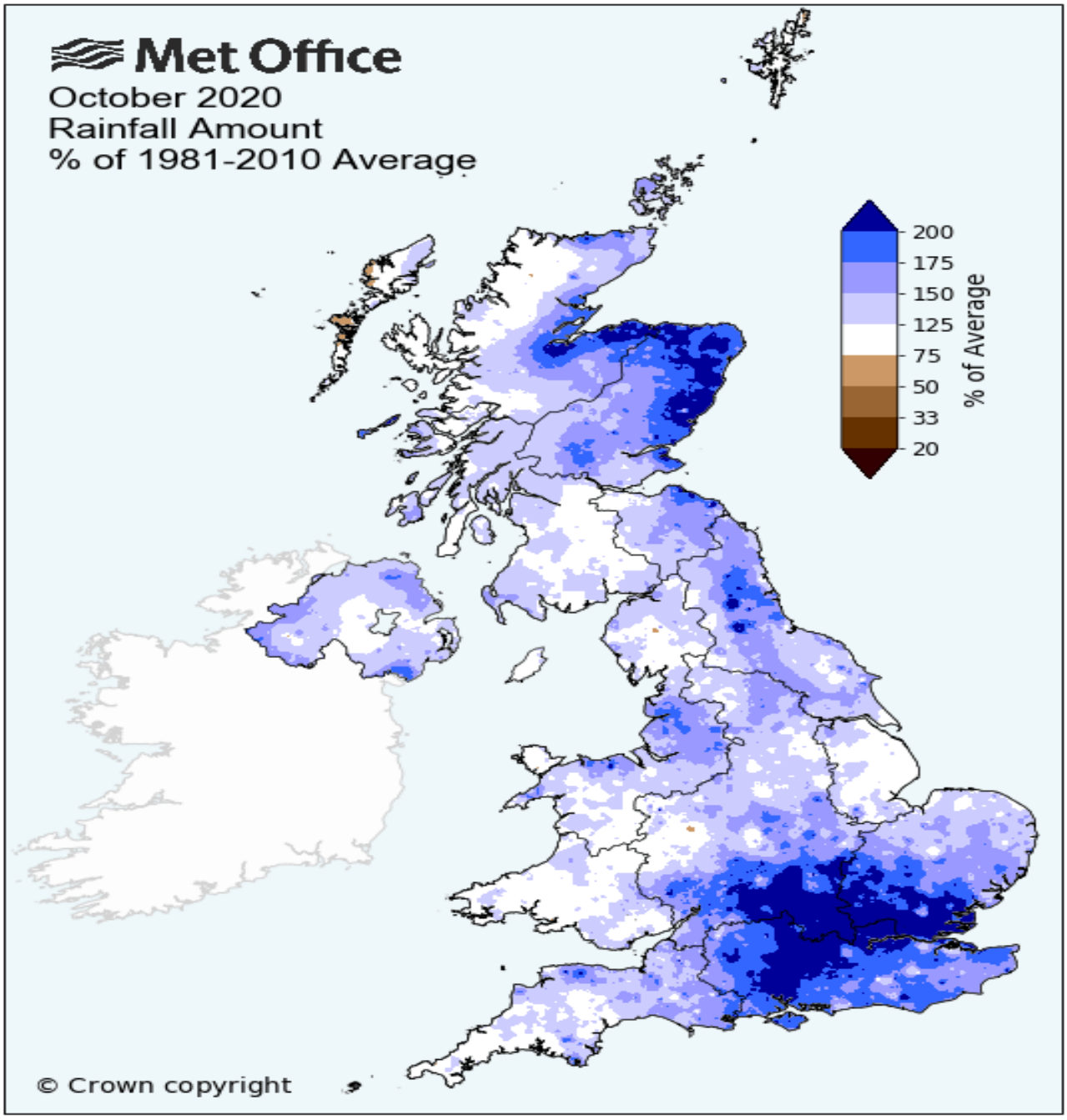
On a county level Oxfordshire experienced the highest volume of rainfall with 222% (160.5mm) of their monthly average. Closely followed by Greater London with 217% (158.1mm) of their monthly average. This month’s provisional figures show that this October for Greater London is the eighth wettest calendar month (in a series that starts in 1862), the fourth wettest October over the same period, and the wettest October in 20 years. November 1940 still holds the record for the wettest month in Greater London with 171.2mm of rainfall.

The October rainfall in Moray, north-east Scotland, was greater than any October since records began in 1862. The area received 205% (200.6mm) of its average October rainfall, following low-pressure systems which were influenced by the decaying elements of Ex-Hurricanes Zeta and Epsilon. A weather station in Kinloss, Moray recorded 165.4mm of rain in the month, 232% of its average rainfall.

Other regions that exceeded double their monthly average rainfall are Bedfordshire 204% (132.7mm), Berkshire 215% (168.1mm), Buckinghamshire 214% (159mm), Essex 211% (134mm), Hertfordshire 217% (159.2mm), Hampshire 205% (203.6mm), and Kincardineshire 211% (237.5mm).

Durris, Kincardineshire received 112.4mm of rainfall in just one day on 3rd October (its wettest day on record), beating the previous record of 90.3mm on 21st October 2009.

	Rainfall	
Provisional October figures	**Actual rainfall**	**% of the October average**
UK	179.3mm	142
England	140.6mm	154
Wales	208.4mm	123
Scotland	238.1mm	136
Northern Ireland	165.7mm	139



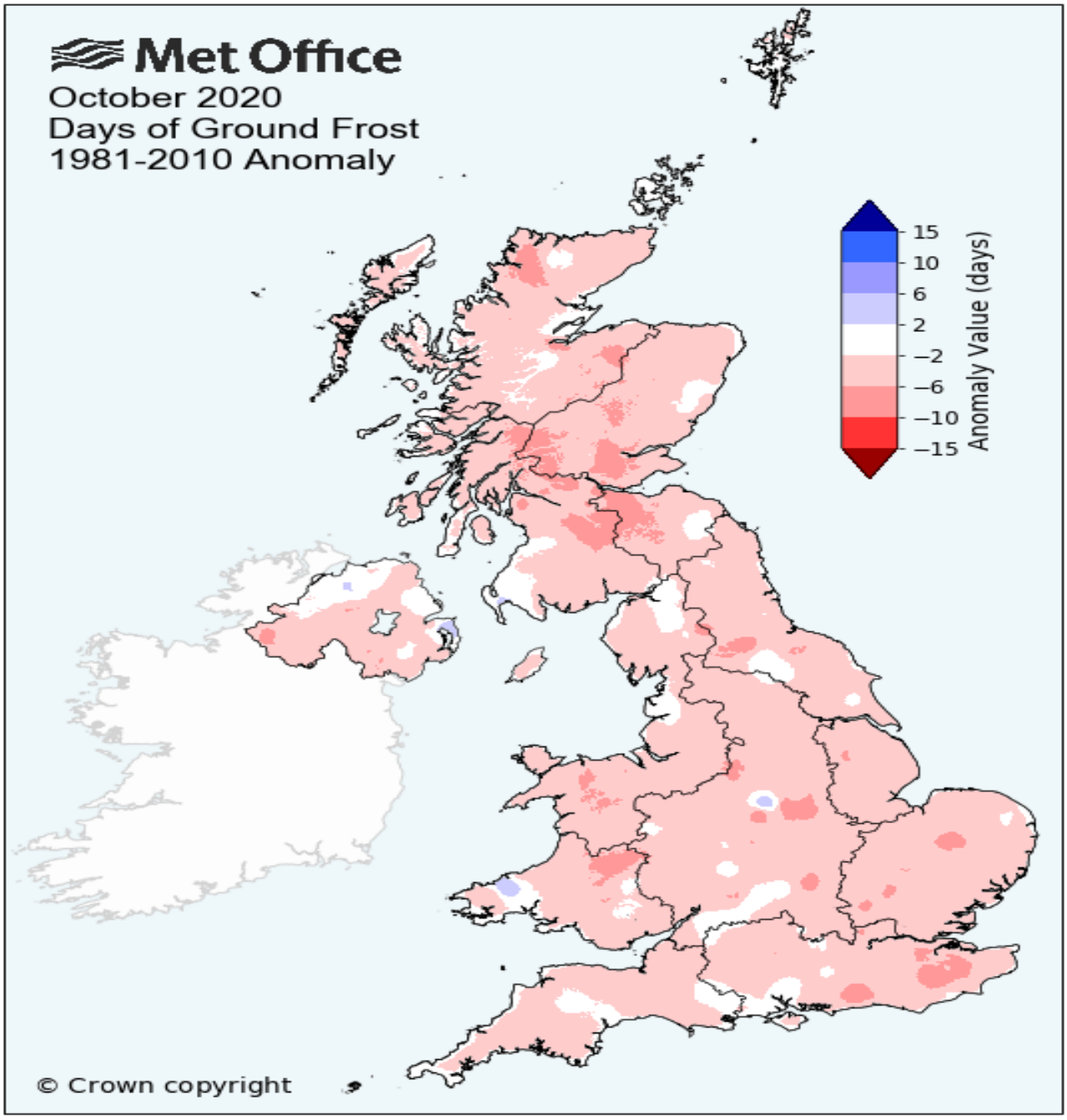
Temperature

There has been an absence of warm days this month, with daytime temperatures mostly a little below average. There was a period of warmer moist tropical maritime air around the 20th and 21st , with a maximum temperature of 19 Celsius being recorded on the 20th at Kew Gardens in Greater London. Overall, temperatures have been mostly near or slightly below average, with daytime temperatures particularly suppressed relative to the seasonal average.

The lowest minimum temperature recorded was –3.3 Celsius at Tyndrum, Perthshire in Scotland onthe 15th and the highest temperature recorded was 19.1 Celsius at Writtle, Essex on the 8th.

	Maximum temperature		**Minimum temperature**	
Provisional October figures	**Actual °C**	**Difference from Oct average °C**	**Actual °C**	**Difference from Oct average °C**
UK	12.4	-0.4	6.4	0.2
England	13.4	-0.5	7.2	0.3
Wales	12.5	-0.6	6.9	0.2
Scotland	10.7	-0.2	5.1	0.1
Northern Ireland	12.4	-0.3	6.2	0.1

Tim Legg said, “Gardeners would have expected to see at least one air frost in southern England in October, but the only recorded frosts this October were confined to northern regions.”



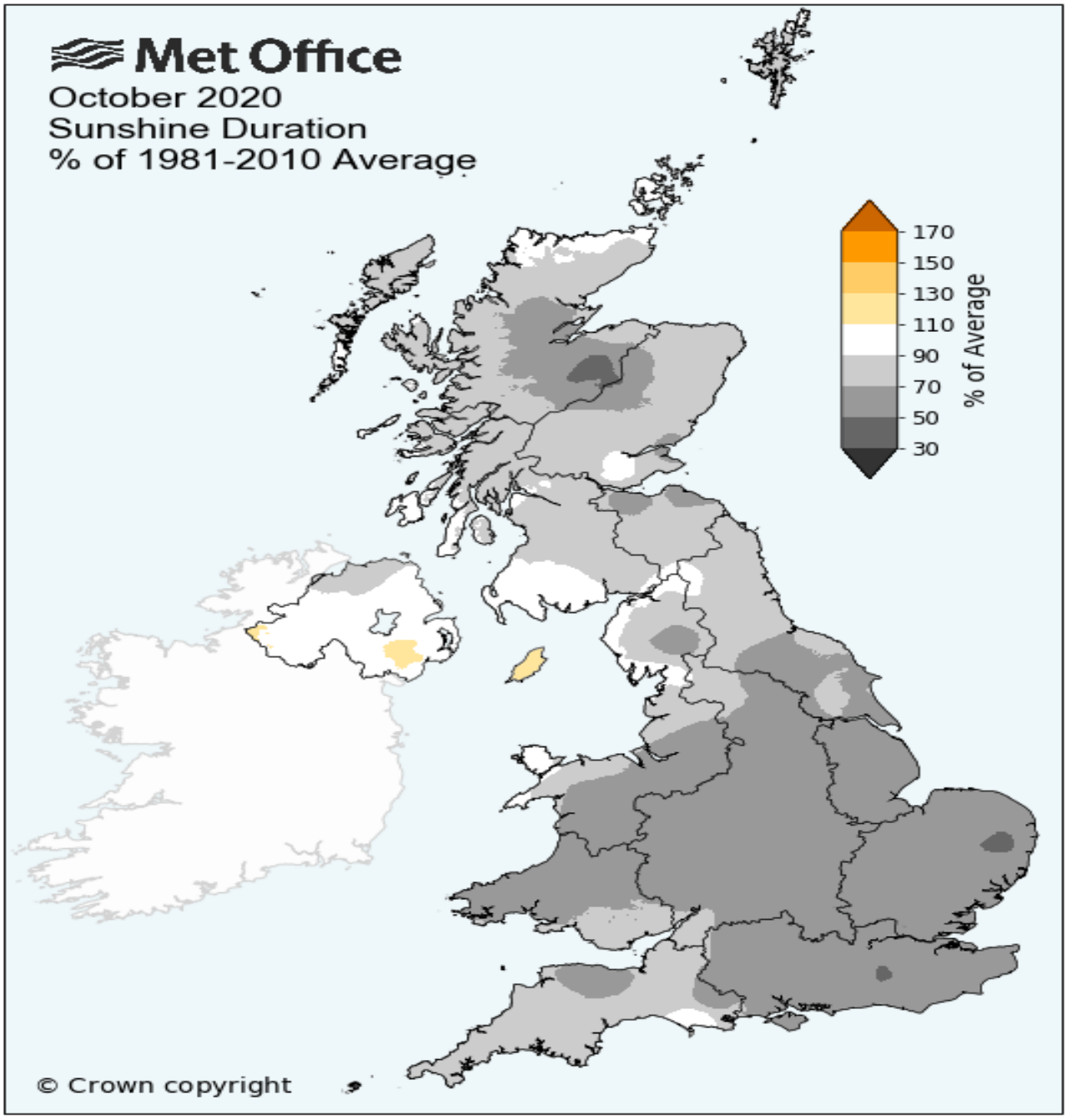
Sunshine

October for the UK as a whole was rather dull, seeing less than three-quarters of its average sunshine hours (72%). For the South of England in particular only 62%
of the average sunshine was recorded. Northern Ireland has seen the most sunshine with 101% of its average for the month, with County Armagh receiving 108% (99.7 hours).

Tim Legg in the Met Office National Climate Information Centre says, “Sunshine was well below average generally, most especially in East Anglia, but near average in Northern Ireland and the Isle of Man. For the UK as a whole this was the fifth wettest and also the fifth dullest October in the

historical series, since 1862 and 1919 respectively”.

	Sunshine Hours	
Provisional October figures	**Actual sunshine in hours**	**% of the September average**
UK	66.0	72
England	67.4	65
Wales	62.9	68
Scotland	60.2	80
Northern Ireland	88.5	101



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For the latest guidance to follow during the COVID-19 pandemic please visit the UK Government's coronavirus advice page. Those living in Scotland, Wales and Northern Ireland can access country-specific advice.

Date Created
November 2020

A record-breaking year for Atlantic Tropical Storms

Description

2020 is shaping up to be a year for weather records – a new record for the highest temperature reliably recorded on earth in Death Valley this summer, the most land scorched in a single year during the Californian wildfires and now the busiest season on record for Atlantic tropical storms.

Julian Heming, Tropical Prediction Scientist at the Met Office said: "With the naming of Tropical Storm Theta earlier this week, the count for tropical storms in the Atlantic this season currently stands at 29, surpassing the previous record busiest year of 2005.

"Indicating just how busy this year's Atlantic hurricane season has been, forecasters were forced to use supplementary names from the Greek alphabet, after using up all names on the official National Hurricane Center list for 2020. This has only ever happened once before in 2005."

> Subtropical Storm #Theta has developed tonight in the Northeast Atlantic, the 29th named storm of the 2020 Atlantic Hurricane Season.
>
> This breaks the single season record for the most named storms previously held by the 2005 Hurricane Season.
>
> Details: https://t.co/lqZULHcvhJ pic.twitter.com/ZFPgUa5Dmp
>
> — National Hurricane Center (@NHC_Atlantic) November 10, 2020

This year's Atlantic hurricane season has also set a new record for the most consecutive years where the season started early. The season officially starts on 1st June, but this year Tropical Storms Arthur and Bertha formed off the east coast of the USA in May, marking the sixth year in a row where the hurricane season started before the official start date.

Commenting on the record-breaking year, **Julian Heming continued:** "From early in the season there were higher-than-average sea surface temperatures across much of the region and low vertical wind shear which allows storms to form more readily.

"The latter condition is partially as a result of the La Niña which has now become established. In addition to the early start to the season, the latter part of the season (October and November) has been exceptionally active, which has helped drive the storm count to record levels."

There are currently indications that another storm could develop in the Caribbean Sea, so extendingthe record storm count. Whilst the season ends officially on 30 November, activity can continue beyondthis date – particularly in active seasons. For example, in the previous record setting season of 2005there were two storms in December.

You can get updates on the latest tropical cyclones by following @metofficestorms

Date Created
November 2020

Tropical Deforestation – a log jam on the road to Net Zero?

Description

With one year to go until COP26 in Glasgow, and today's launch of Together For Our Planet, Met Office Chief Scientist Professor Stephen Belcher reviews the influence tropical deforestation is having on the journey to a resilient Net Zero through the significant role they play in balancing atmospheric CO_2 concentrations, storing carbon and changing the water cycle.

We all learn about the basic principles of photosynthesis at school, the importance of plants providing the oxygen we breathe and also how they absorb carbon dioxide. So, on a simple level we all understand how important the 'lungs' of the earth are to enable all forms of life. But plants are also playing an important role in global climate change and the challenge to keep warming to manageable levels.

Tropical forests cover a remarkable area, something like 12% (17 million km^2) of the earth's land surface. With this scale they not only cycle vast amounts of the oxygen that supports life, but are also incredibly important sinks of carbon from our atmosphere. Around 200 gigatons of carbon are stored in tropical forest vegetation, with further carbon stored in soils. If the carbon in the standing timber were released it would be equivalent to emitting 667 gigatons of CO_2, which is equivalent to all fossil emissions of CO_2 since about 1997. And as atmospheric CO_2 concentrations increase as a consequence of human activity, tropical forests are likely to act as stronger sinks for carbon.

So, deforestation reduces the amount of carbon that forests can store, meaning that a higher proportion of future CO_2 emissions from fossil fuels will remain in the atmosphere, leading to larger

changes in climate. And deforestation is a double whammy: by cutting down these trees we also release CO_2 emissions previously stored in the forest system.

Deforestation also affects the climate by altering surface distribution of radiation, water and heat, so-called non-CO_2 effects.

Tropical forest is often replaced by crops and pasture, which tend to be lighter in colour than forests, which means that after deforestation more sunlight is reflected from the land back into space. This reduced absorption of sunlight leads to cooling.

However, when plants take in CO_2 from the air they transpire, they lose water to the air, which carries heat away from the surface. Crops and grasses tend to transpire less than forests, meaning that after deforestation heat is less efficiently lost from the land surface and the surface climate is warmer.

The numbers are delicate. At high latitudes deforestation causes a large cooling effect from increased reflection of sunlight and a small warming from reduced transpiration, resulting in a net cooling at the surface. However, in the tropics, where deforestation rates are currently highest, the transpiration affect is much larger, and deforestation causes a net warming at the surface.

Although not as important on a global scale, these non-CO_2 effects are one of the most important contributors to warming near the location of deforestation. This effect does have global implications because warmer local temperatures reduces the ability of the forest to absorb atmospheric CO_2 by photosynthesis, leading to a warmer background global climate.

There is also moisture recycling and land management to consider. For example, different crops can have varying responses to factors such as drought, and ploughing releases further CO_2 emissions from the soil, reducing the carbon sink still further. Deforestation can also impact the rainfall in other parts of the forest, meaning they may not get the rainfall they need to stay healthy and resilient. It may even affect rainfall patterns elsewhere in the world.

It's important to understand the scale. Statistics from the UN's Food and Agriculture Organization (FAO) show that, at its peak, the rate of deforestation in the tropics reached 95,430 km^2 per year. This has gradually decreased from 1990 to 2015, dropping to 55,200 km^2 per year. But that is still around a football pitch every 4 seconds for the 2010-2015 period, or all of the forests in the UK gone in about 7 months! Concerningly deforestation of the Amazon has increased, particularly in 2019 which saw the highest rate in a decade.

So what does this all mean in the context of net zero, the target that nations around the world are racing towards to balance up their carbon emissions and not contribute further to human induced climate change?

Well, its first important to say that net zero will not be achieved through limiting tropical deforestation alone. Ultimately net zero can only be achieved by substantially reducing the use of fossil fuels. However, net zero will be made easier if tropical deforestation is limited.

While net zero is an important target, it is not only climate change that will benefit from stopping deforestation. Forests are important habitats, are culturally important and provide other ecosystem services. So there are a multitude of benefits from taking the same action.

Positive steps are being taken. For example, Brazil's stated Intended Nationally Determined Contribution (INDC) to the UN's climate change treaty includes eliminating illegal logging and restoring 120,000 km^2 of forest by 2030.

So what can science do to play a part? We need to quantify the effects of deforestation on climate, and

work at the Met Office is doing just that. We have developed with UK academic partners the UK Earth System Model (UKESM1) to simulate two-way feedbacks between forests and climate, including the impacts of deforestation and the impact of climate change on forest resilience.

Alongside this large-scale perspective, we are also working to better understand the small-scale processes that drive the processes, using the JULES land-surface model to simulate forests at key observational sites. Much of this work is being done under the CSSP Brazil program in partnership with Brazilian colleagues at INPE, INPA and CEMADEN, and with UK academic partners.

Ultimately, we are using our earth system modelling to assess the impacts of future deforestation and mitigation on climate and to calculate carbon budgets that avoid the worst impacts of climate change. With this scientific information policy makers can make informed decisions on how they will act when it comes to deforestation.

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